

SILICON N-CHANNEL DUAL GATE MOS-FET

Depletion type field-effect transistor in a plastic X-package with source and substrate interconnected, intended for VHF applications, such as VHF television tuners, FM tuners, with 12 V supply voltage. This MOS-FET tetrode is protected against excessive input voltage surges by integrated back-to-back diodes between gates and source.

QUICK REFERENCE DATA

| | | | |
|---|-------------|------|----------------------|
| Drain-source voltage | V_{DS} | max. | 20 V |
| Drain current | I_D | max. | 40 mA |
| Total power dissipation up to $T_{amb} = 75\text{ }^\circ\text{C}$ | P_{tot} | max. | 225 mW |
| Junction temperature | T_j | max. | 150 $^\circ\text{C}$ |
| Transfer admittance at $f = 1\text{ kHz}$ $I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; +V_{G2-S} = 4\text{ V}$ | $ y_{fs} $ | typ. | 25 mS |
| Input capacitance at gate 1; $f = 1\text{ MHz}$ $I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; +V_{G2-S} = 4\text{ V}$ | C_{ig1-s} | typ. | 4.0 pF |
| Feedback capacitance at $f = 1\text{ MHz}$ $I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; +V_{G2-S} = 4\text{ V}$ | C_{rs} | typ. | 30 fF |
| Noise figure at $G_S = 2\text{ mS}; B_S = B_{S\text{ opt}}$ $I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; +V_{G2-S} = 4\text{ V}; f = 200\text{ MHz}$ | F | typ. | 1.2 dB |

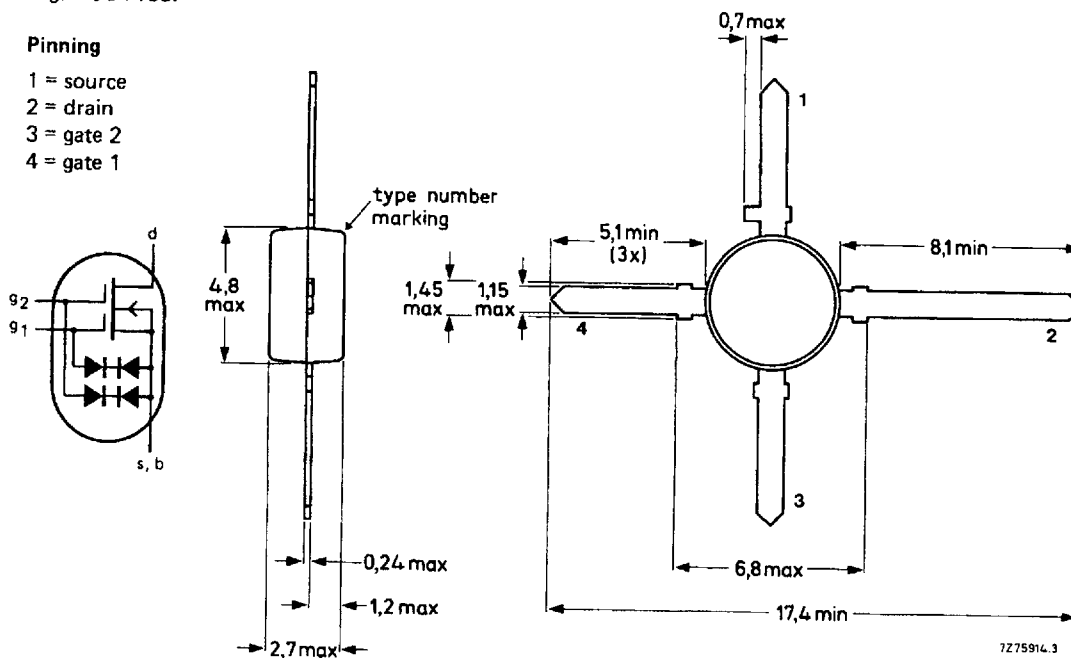
MECHANICAL DATA

Dimensions in mm

Fig.1 SOT103.

Pinning

- 1 = source
- 2 = drain
- 3 = gate 2
- 4 = gate 1



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

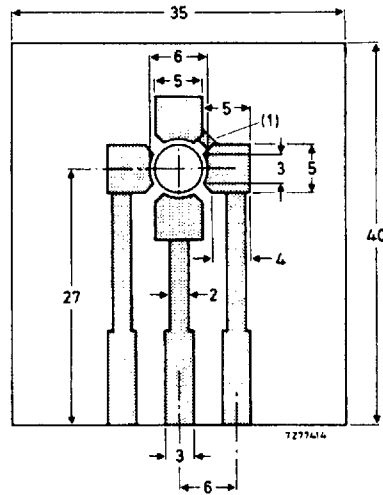
| | | | |
|--|----------------|------|------------------------------|
| Drain-source voltage | V_{DS} | max. | 20 V |
| Drain current (DC or average) | I_D | max. | 40 mA |
| Gate 1 - source current | $\pm I_{G1-S}$ | max. | 10 mA |
| Gate 2 - source current | $\pm I_{G2-S}$ | max. | 10 mA |
| Total power dissipation up to $T_{amb} = 75\text{ }^\circ\text{C}$ | P_{tot} | max. | 225 mW |
| Storage temperature range | T_{stg} | | -65 to +150 $^\circ\text{C}$ |
| Junction temperature | T_j | max. | 150 $^\circ\text{C}$ |

THERMAL RESISTANCE

From junction to ambient in free air
mounted on the printed-circuit board (see Fig. 2)

$R_{th\ j-a} = 335\text{ K/W}$

Dimensions in mm



(1) Connection made by a strip or Cu wire.

Fig. 2 Single-sided 35 μm Cu-clad epoxy fibre-glass printed-circuit board, thickness 1,5 mm. Tracks are fully tin-lead plated. Board in horizontal position for R_{th} measurement.

STATIC CHARACTERISTICS

 $T_j = 25\text{ }^\circ\text{C}$

Gate cut-off currents

| | | | |
|--|-----------------|---|-------|
| $\pm V_{G1-S} = 7\text{ V}; V_{G2-S} = V_{DS} = 0$ | $\pm I_{G1-SS}$ | < | 25 nA |
| $\pm V_{G2-S} = 7\text{ V}; V_{G1-S} = V_{DS} = 0$ | $\pm I_{G2-SS}$ | < | 25 nA |

Gate-source breakdown voltages

| | | | |
|---|---------------------|---|-----------|
| $\pm I_{G1-SS} = 10\text{ mA}; V_{G2-S} = V_{DS} = 0$ | $\pm V_{(BR)G1-SS}$ | > | 8 to 20 V |
| $\pm I_{G2-SS} = 10\text{ mA}; V_{G1-S} = V_{DS} = 0$ | $\pm V_{(BR)G2-SS}$ | > | 8 to 20 V |

Gate-source cut-off voltages

| | | | |
|---|----------------|---|-------|
| $I_D = 20\text{ }\mu\text{A}; V_{DS} = 10\text{ V}; +V_{G2-S} = 4\text{ V}$ | $-V_{(P)G1-S}$ | < | 1.3 V |
| $I_D = 20\text{ }\mu\text{A}; V_{DS} = 10\text{ V}; V_{G1-S} = 0$ | $-V_{(P)G2-S}$ | < | 1.1 V |

DYNAMIC CHARACTERISTICS

Measuring conditions (common source): $I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; +V_{G2-S} = 4\text{ V}; T_{amb} = 25\text{ }^\circ\text{C}$

| | | | |
|---|-------------|------|--------|
| Transfer admittance at $f = 1\text{ kHz}$ | $ y_{fs} $ | > | 20 mS |
| | | typ. | 25 mS |
| Input capacitance at gate 1; $f = 1\text{ MHz}$ | C_{ig1-s} | typ. | 4.0 pF |
| Input capacitance at gate 2; $f = 1\text{ MHz}$ | C_{ig2-s} | typ. | 1.7 pF |
| Feedback capacitance at $f = 1\text{ MHz}$ | C_{rs} | typ. | 30 fF |
| Output capacitance at $f = 1\text{ MHz}$ | C_{os} | typ. | 2.0 pF |
| Noise figure at $f = 200\text{ MHz}; G_S = 2\text{ mS}; B_S = B_S\text{ opt}$ | F | typ. | 1.2 dB |